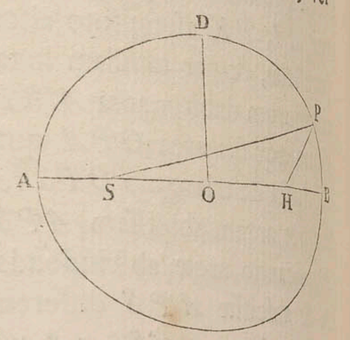
primam medii motus æquationem, ad angulum Y, æquationem maximam primam, ut eſt ſinus dupli anguli T ad radium; atque angulum X, æquationem ſecundam, ad angulum Z, æquationem maximam ſecundam, ut eſt cubus ſinus anguli T ad cubum radii. Angulorum T, V, X vel ſummæ T+X+V, ſi angulus T recto minor eſt, vel differentiæ T+X—V, ſi is recto major eſt rectiſque duobus minor, æqualem cape angulum *BHP*, motum medium æquatum; & ſi *HP* occurrat ellipſi in *P*, acta *SP* abſcindet aream *BSP* tempori proportionalem quamproxime. Hæc praxis ſatis expedita videtur, propterea quod angulorum perexiguorum V & X, in minutis ſecundis, ſi placet, poſitorum, figuras duas treſve primas invenire ſufficit. Sed & ſatis accurata eſt ad theoriam planetarum. Nam in orbe vel Martis ipſius, cujus æquatio centri maxima eſt graduum decem, error vix ſuperabit minutum unum ſecundum. Invento autem angulo motus medii æquati *BHP*, angulus veri motus *BSP* & diſtantia *SP* in promptu ſunt per methodum notiſſimam.



Hactenus de motu corporum in lineis curvis. Fieri autem poteſt ut mobile recta deſcendat vel recta aſcendat, & quæ ad iſtiuſmodi motus ſpectant, pergo jam exponere.

SECTIO VII.

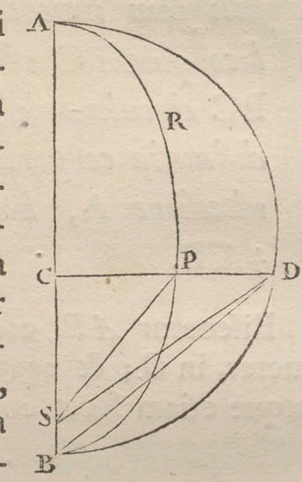
De corporum aſcenſu & deſcenſu rectilineo.

PROPOSITIO XXXII. PROBLEMA XXIV.

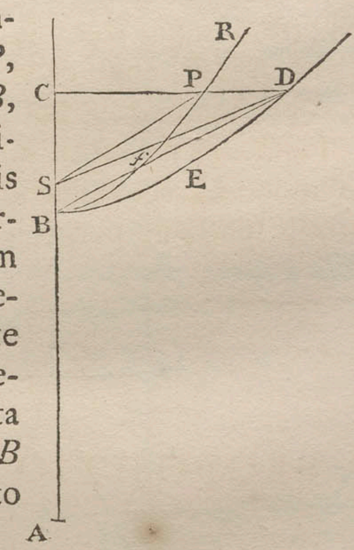
Poſito quod vis centripeta ſit reciproce proportionalis quadrato diſtantiæ locorum a centro, ſpatia definire quæ corpus recta cadendo datis temporibus deſcribit.

Caſ. 1. Si corpus non cadit perpendiculariter, deſcribet id (per corol. 1. prop. XIII) ſectionem aliquam conicam cujus umbilicus congruit cum centro virium. Sit ſectio illa conica *ARPB* & umbilicus

bilicus ejus *S*. Et primo ſi figura ellipſis eſt; ſuper hujus axe majore *AB* deſcribatur ſemicirculus *ADB*, & per corpus decidens tranſeat recta *DPC* perpendicularis ad axem; actiſque *DS*, *PS* erit area *ASD* areæ *ASP*, atque ideo etiam tempori proportionalis. Manente axe *AB* minuatur perpetuo latitudo ellipſeos, & ſemper manebit area *ASD* tempori proportionalis. Minuatur latitudo illa in infinitum: & orbe *APB* jam coincidente cum axe *AB* & umbilico *S* cum axis termino *B*, deſcendet corpus in recta *AC*, & area *ABD* evadet tempori proportionalis. Dabitur itaque ſpatium *AC*, quod corpus de loco *A* perpendiculariter cadendo tempore dato deſcribit, ſi modo tempori proportionalis capiatur area *ABD*, & a puncto *D* ad rectam *AB* demittatur perpendicularis *DC*. *Q. E. I.*



Caſ. 2. Si figura illa *RPB* hyperbola eſt, deſcribatur ad eandem diametrum principalem *AB* hyperbola rectangula *BED*: & quoniam areæ *CSP*, *CBfP*, *SPfB* ſunt ad areas *CSD*, *CBED*, *SDEB*, ſingulæ ad ſingulas, in data ratione altitudinum *CP*, *CD*; & area *SPfB* proportionalis eſt tempori quo corpus *P* movebitur per arcum *PfB*; erit etiam area *SDEB* eidem tempori proportionalis. Minuatur latus rectum hyperbolæ *RPB* in infinitum manente latere tranſverſo, & coibit arcus *PB* cum recta *CB* & umbilicus *S* cum vertice *B* & recta *SD* cum recta *BD*. Proinde area *BDEB* proportionalis erit tempori quo corpus *C* recto deſcenſu deſcribit lineam *CB*. *Q. E. I.*



Caſ. 3. Et ſimili argumento ſi figura *RPB* parabola eſt, & eodem vertice principali *B* deſcribatur alia parabola *BED*, quæ ſemper maneat data, interea dum parabola prior, in cujus perimetro corpus *P* movetur, diminuto & in nihilum redacto ejus latere recto, conveniat cum linea *CB*; fiet ſegmentum parabolicum *BDEB* proportionale tempori quo corpus illud *P* vel *C* deſcendet ad centrum *S* vel *B*. *Q. E. I.*